Name:

at1121exam_practice: Radicals and Squares (v612)

Question 1

Simplify the radical expressions.

$\sqrt{44}$ $\sqrt{45}$ $\sqrt{20}$

$\sqrt{2 \cdot 2 \cdot 11}$ $\sqrt{3 \cdot 3 \cdot 5}$ $\sqrt{2 \cdot 2 \cdot 5}$

$2\sqrt{11}$ $3\sqrt{5}$ $2\sqrt{5}$

Question 2

Find all solutions to the equation below:

$$2\left((x+7)^2+10\right) \;=\; 70$$

First, divide both sides by 2.

$$(x+7)^2+10=35$$

Then, subtract 10 from both sides.

$$(x+7)^2=25$$

Undo the squaring. Remember the plus-minus symbol.

$$x+7=\pm 5$$

Subtract 7 from both sides.

$$x=-7\pm 5$$

So the two solutions are $x=-2$ and $x=-12$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 + 12x = 64$$

$$x^2 + 12x + 36 = 64 + 36$$
$$x^2 + 12x + 36 = 100$$
$$(x + 6)^2 = 100$$
$$x + 6 = \pm 10$$
$$x = -6 \pm 10$$
$$x = 4 \quad \text{or} \quad x = -16$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 16x + 37$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 8x) + 37$$

We want a perfect square. Halve -8 and square the result to get 16 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 8x + 16 - 16) + 37$$

Factor the perfect-square trinomial.

$$y = 2((x - 4)^2 - 16) + 37$$

Distribute the 2.

$$y = 2(x - 4)^2 - 32 + 37$$

Combine the constants to get **vertex form**:

$$y = 2(x - 4)^2 + 5$$

The vertex is at point $(4, 5)$.